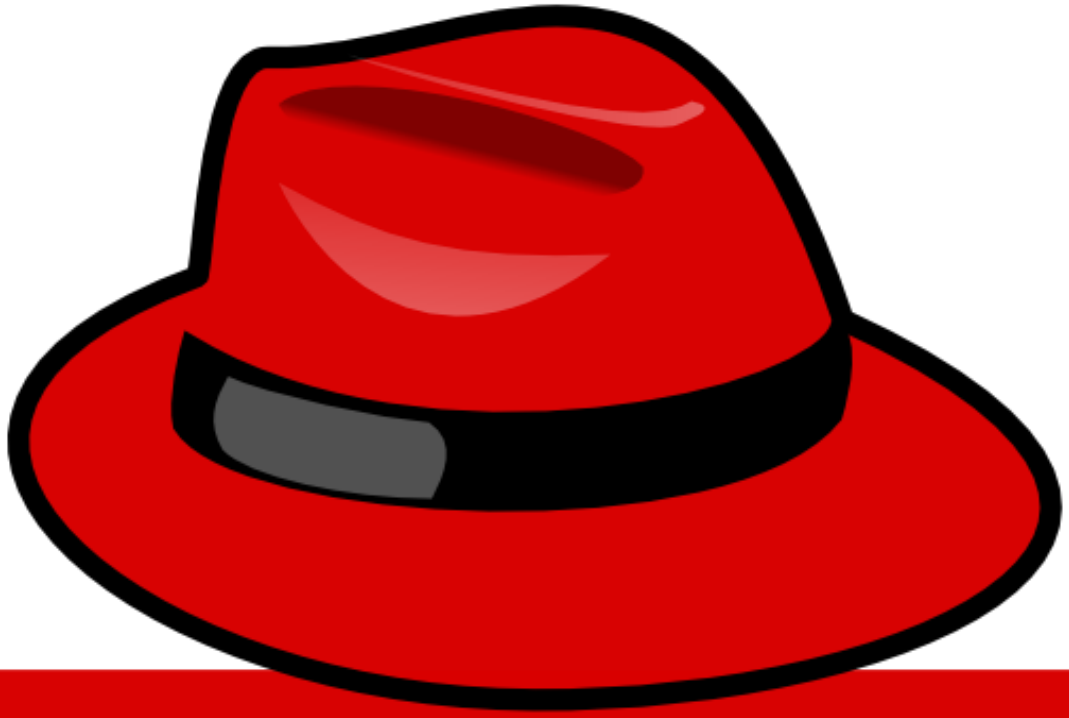
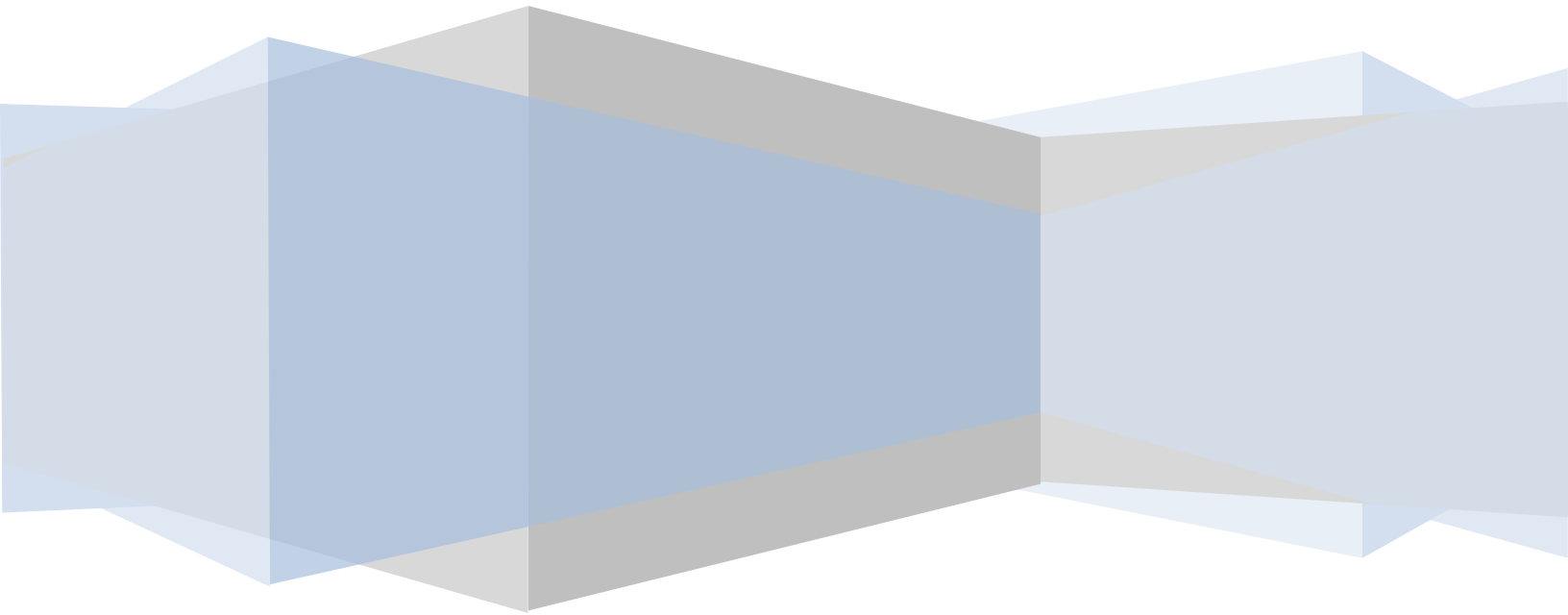
Red Hat Enterprise Linux 5



Essentials

Red Hat Enterprise Linux 5 Essentials



Red Hat Enterprise Linux 5 Essentials – First Edition

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Chapter 1. About RHEL 5 Essentials

Arguably one of the most highly regarded and widely used enterprise Linux distributions available today is Red Hat Enterprise Linux (RHEL). It is considered to be amongst the most stable and reliable operating systems and is backed by the considerable resources and technical skills of Red Hat, Inc.

RHEL 5 Essentials is designed to provide detailed information on the use and administration of the Red Hat Enterprise Linux 5 distribution. For beginners, the book covers the basics of configuring the desktop environment, resolving screen resolution issues and configuring email and web servers. Installation topics such as network installation and dual booting with Microsoft Windows are covered together with all important security topics such as configuring a firewall and user and group administration.

For the experienced user, topics such as remote access, logical volume management (LVM), disk partitioning, swap management, Xen and KVM virtualization, Secure Shell (SSH) and file sharing using both Samba and NFS are covered in detail to provide a thorough overview of this enterprise class operating system.

Chapter 2. Installing RHEL 5 on a Clean Disk Drive

The first step on the path to learning about Red Hat Enterprise Linux involves installing the operating system. RHEL can be installed either in a *clean disk* environment (where an entire disk is cleared of any existing partitions and dedicated entirely to RHEL) or in a *dual boot* environment where RHEL co-exists with another operating system on the disk (typically a member of the Microsoft Windows family of operating systems).

In this chapter we will be covering the clean disk approach to installation. Dual boot installation will be covered in Installing RHEL 5 with Windows in Dual Boot Environment.

2.1 Obtaining the Red Hat Enterprise Linux Installation Media

Although RHEL is an open source operating system, and as such, the source code is freely downloadable, the binary installation images are only available as part of a paid Red Hat Enterprise Linux subscription. In addition to access to the installation images for RHEL, this subscription also provides technical support for the operating system. If you already have a paid subscription, log into your Red Hat account to download the operating system. If you would like to try out RHEL before purchasing, Red Hat provides a 30-day trial. To register for a trial, visit the Red Hat website at http://www.redhat.com/rhel/details/eval/ and complete the registration process.

The installation distribution can be downloaded as either six individual CDROM images or a single DVD image. Unless you specifically need to use CD images the DVD installation image is strongly recommended. The DVD image is named using the following convention:

```
rhel-<variant>-<version>-<architecture>-bin-DVD.iso
```

For example, the RHEL 5.5 server DVD image for 64-bit systems is named as follows:

```
rhel-server-5.5-x86_64-dvd.iso
```

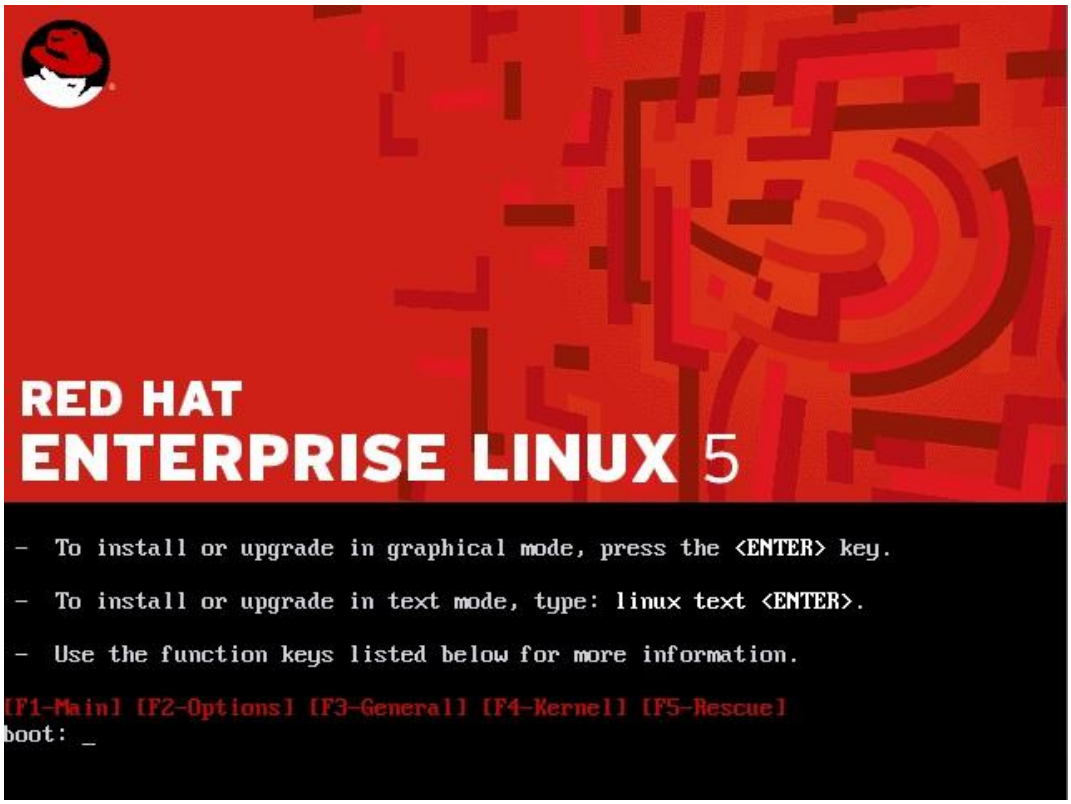
The CDROM images, on the other hand, are named as follows:

```
rhel—<variant>-<version>-<architecture>-bin-disc<i>n</i>.iso
```

Having downloaded either DVD or CDROM images, either burn them to disk, configure your virtualization environment to treat them as DVD or CDROM drives or use the steps outlined in Performing an RHEL 5 Network Installation to access the installation image over a network.

2.2 Installing Red Hat Enterprise Linux

Insert either the RHEL DVD or disk 1 of the CDROM collection into the appropriate drive and power on the system. If the system tries to boot from the hard disk drive you will need to enter the BIOS set up for your computer and change the boot order so that it boots from the CD or DVD drive first. Once the system has booted you will be presented with the following screen:



Installation may be performed using either the graphical or text mode installers. To install using the graphical installer, simply press the <Enter> key. To use the text installer type *linux text* followed by the <Enter> key.

The RHEL installer will then provide the option to test the installation media for errors. Use the arrow keys to navigate between the options and make a selection with the <Enter> key. After a short delay the first screen of the graphical installer will appear. Click on the *Release Notes* button if you would like to learn about any key features or problems that exist in this release of RHEL. Navigate through the next few pages to configure your preferred language and keyboard type until you reach the partitioning screen. During these steps you may be prompted to enter an Installation Number. If you have a subscription that includes additional packages, enter that number here so that those packages may be accessed during the installation process.

2.3 Partitioning a Disk for RHEL

When you reach the disk partitioning phase of the installation, the installer will present a screen similar to the one illustrated in the following figure:

The drop down menu provides a number of options in terms of how the disk will be used to accommodate the RHEL installation:

- **Remove all partitions on selected drives and create default layout** - The entire disk drive will be assigned to the RHEL installation. Any pre-existing partitions, together with any existing operating systems and associated data files contained therein will be deleted to make room for RHEL. This option should only be used if you are absolutely sure you no longer need anything that is currently stored on that disk, or have already backed up all user files.

- **Remove Linux partitions on selected drives and create default layout** - If the drive was previously configured to support a Windows/Linux dual boot environment or was devoted entirely to another Linux installation, this option may be selected to instruct the installer to delete the pre-existing Linux partition and replace it with RHEL, leaving the non-Linux partitions intact. Once again, it is important to backup any user data that may still be needed.

- **Use free space on selected drives and create default layout** - If the current partitions on the drive do not take up the entire disk space available, any unallocated space may be assigned to the RHEL installation using this option.

- **Create custom layout** - When selected, this option displays the disk partitioning tool allowing each partition on the disk to be manually configured.

For the purposes of this chapter we are assuming the entire disk is available to accommodate the RHEL installation so select the *Remove all partitions on selected drives and create default layout* menu option.

Beneath the partition menu is the option to encrypt the system. The choice of whether to use encryption will depend on the purpose for which the system is being used, its physical location and type of data it is going to store. Keep in mind that as with any form of encryption there are performance overheads associated with selecting this option.

Having made the partitioning selection, choose which disk drives detected on your system are to be used for the installation and click *Next* to begin the partitioning process.

2.4 Configuring Networking Settings

After the disk partitioning and encryption decisions have been made the installer will prompt for some networking configuration information. If your system resides on a network served by a DHCP server (a server or device that automatically assigns network IP addresses to computers on the network) you should leave the default settings unchanged in the *Network Devices* section of the screen. If you need to manually specify an IP address, select the network device from the list and click on the Edit button to display the *Edit Interface* dialog and enter your IP address and netmask information, then close the dialog and enter the gateway and DNS settings for your network into the *Miscellaneous settings* section of the main screen.

If you manually specified your IP address, or have a DHCP server that does not automatically provide clients with host names, select the option to manually specify the host name and enter it into the text box and click Next to proceed.

2.5 Timezone and the Root Password

On the Timezone screen, make a selection corresponding to your geographical location. The option is also provided to use UTC which automatically adjusts the time to account for daylight savings time. If the computer on which RHEL is being installed also runs another operating system which already uses UTC (such as Windows), leave this option unselected.

On the next screen, enter a password for the root account on the system. The root, or super-user account is a special user that has administrative privileges on the system. Whilst you will generally use your own account to log into the system, you will need to gain root privileges in order to configure the system and to perform other administrative tasks.

2.6 Package Selection

Linux is a modular operating system in that it provides a basic operating system kernel and infrastructure upon which a range of different packages may be installed depending on your specific requirements for the system. If, for example, you plan on using the system as a web server you would need to install the Apache web server package.

At this point in the installation the installer needs us to decide which packages should be installed along with the base operating system and displays the screen shown in the following figure:

The exact options displayed will depend in part on the specific RHEL installation image that was downloaded from the Red Hat web site.

This screen allows you to make general choices about the type of functions you need the system to perform.

To view or modify the specific package selections, make sure that the *Customize Now* option is selected before proceeding. You will then be provided a complete overview of which packages are selected for installation and which are not together with the ability to make changes to these selections. Don't worry too much about getting this exactly right at this stage. Packages can be added and removed at any time after the installation is complete by selecting the desktop *Applications -> Add/Remove Software* menu option.

2.7 The Physical Installation

Having made the appropriate package selections, clicking Next will display a screen indicating that the installation will begin and that a log file and kickstart file can be found on the system after installation is complete. The log file will be useful to identify any errors that occurred during the installation, and the kickstart file can be used to install RHEL on other systems using the exact same configuration created here.

During the installation process, the installer will format and partition the disk drive, provide a running commentary of the selected packages as they are installed and a progress bar. If you are installing from the 6 RHEL CDROM images as opposed to the single DVD you will need to insert the additional CDs when prompted to do so. If you are using the DVD the installation will complete without further interaction. Once the installation process is complete a screen will appear containing a button to reboot the system. Remove the installation media and click the button.

2.8 Final Configuration Steps

After the system has started for the first time, the RHEL Setup Agent will appear with a welcome message. Click on the *Forward* button to display licensing information followed by the Firewall settings. By default all ports are closed on the firewall with the exception of the ssh port which allows you to remotely log into the system. The topic of firewall configuration will be covered in more detail in the chapter entitled Basic RHEL Firewall Configuration so for now leave the default settings unchanged. Leave SELinux configured as *Enforcing* to ensure the most secure environment. Choose whether or not to enable Kdump support and then work through the remaining screens to create a user account for yourself and verify the date and time. If you would like the date and time of your RHEL system to be synchronized with an external Network Time Protocol server, select the *Synchronize date and time over network* option before proceeding.

On the *Setup Software Updates* screen, register the system with the Red Hat Network (RHN). This enables additional packages to be installed from the RHN repositories and also allows the system to receive software updates. In order to register the system, enter your RHN user login

and password when prompted. If you would prefer to register the system at a later time, do so simply by running the *rhn_register* command from a terminal window.

Having worked through all the set up pages, click *Finish* to exit the setup agent and log in using your newly created account credentials.

Chapter 3. Performing an RHEL 5 Network Installation

In addition to installing directly from the physical Red Hat Enterprise Linux 5 installation media (in the form of a CDROM or DVD) it is also possible to perform a network based RHEL installation whereby the installation image is installed on a remote server and downloaded in packages to the destination computer system during installation. RHEL currently supports installation via HTTP, FTP and NFS. For the purposes of this tutorial we will focus on the use of HTTP (in other words the installation image is available via a web server on a remote host) though the concepts are largely the same for the other network installation options.

3.1 RHEL Network Installation Requirements

Before a network installation of RHEL can be performed a number of items are required. Firstly, the RHEL installation image must be loaded onto the remote server and mounted. If the installation media is in the form a CDROM or DVD then the image can be read from that media into a disk based ISO image file using the *dd* command as follows:

```
dd if=/dev/media of=/path/to/iso/file/rhel5-image.iso
```

Note that in the above example, */dev/media* would be replaced by the path to the CDROM device and */path/to/iso/file/* represents the path to a suitable location on the file system to create the image file. Also keep in mind that the installation media may comprise multiple disk images, each of which will need to be imported into the server.

Having created the ISO image file from the installation media, it now needs to be mounted in a location that is accessible to the web server, ftp server or NFS mount point so that it is accessible to the target system. This is achieved using the mount *loopback* interface:

```
mount -o loop rhel5_image.iso /path/to/mount/point
```

In this case, */path/to/mount/point* is replaced by the full path to the location where the RHEL installation image is to be mounted such that it can be accessed via the chosen network installation method. For example, in the case of an HTTP based installation, the chosen mount point might be /var/www/html/rhel5. Note that the specified mount point directory must already exist before executing this command.

3.2 Obtaining a Network Boot Image

Once the remote server is configured with a copy of the RHEL 5 installation image, the next step is to plan how the installation process will be initiated on the target system. Clearly we will still need to be able to boot from something locally to start the installation. One option is to boot

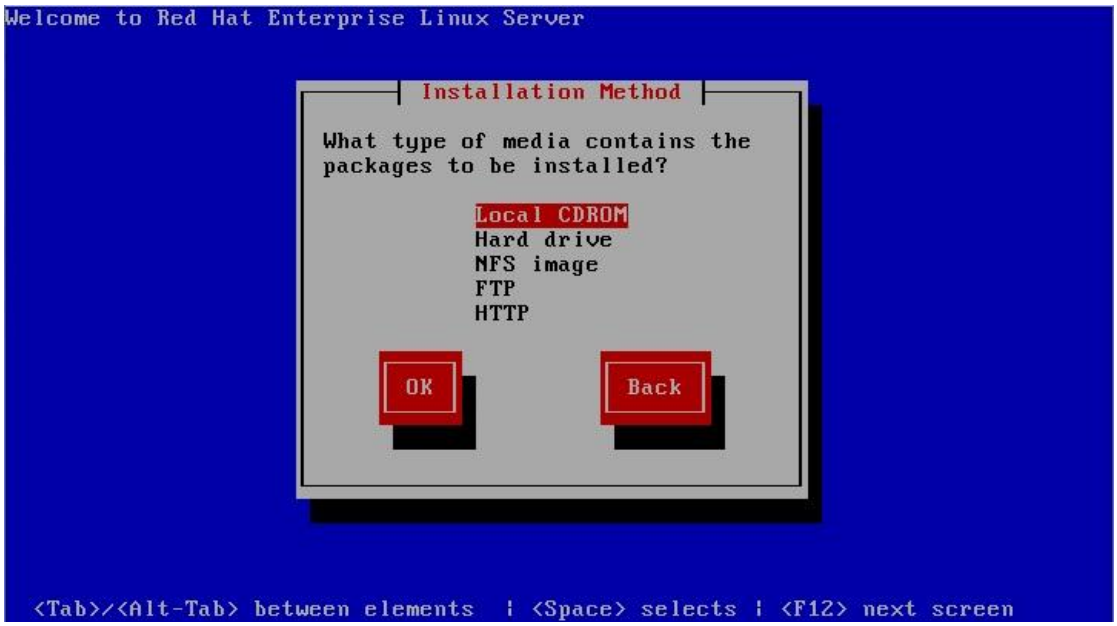
from disk 1 of the six set CDROM installation suite. Alternatively, take the *boot.iso* file from the *images* subdirectory of either the disk 1 CDROM or the installation DVD and burn it to a CDROM or DVD and then boot from that.

3.3 Configuring the Network Installation

When the installer has booted enter the following command at the *boot:* prompt and press the enter key:

```
linux askmethod
```

A sequence of screens will subsequently appear providing the opportunity to select a language and keyboard type. Once these settings have been defined, a screen will appear requesting the location of the installation media:



Depending on the method by which the installation images are being served by the remote system select either *NFS image, FTP* or *HTTP.* For the purposes of this tutorial we will assume the use of HTTP.

Once the installation method has been selected, click *OK* to proceed to the TCP/IP configuration screen. If the computer has multiple network adaptors, select the one to be used during the installation. On the next screen, configure the required IPv4 and IPv6 settings for the network to which the computer is attached: